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THE STARS IN THEIR SEASO

By RICHARD A. PROCTOR.

LONDON:

& SONS, 74, 75, & 76, GREAT QUEEN STREET, W

184.h.79.

THE

STARS IN THEIR SEASONS,

AN EASY GUIDE TO A KNOWLEDGE OF THE STARS

EXHIBITING, IN TWELVE LARGE MAPS, THE APPEARANCE
OF THE HEAVENS AT ANY HOUR OF THE NIGHT
ALL THE YEAR ROUND.

By RICHARD A. PROCTOR.

Ταῦτά κε θηήσαιο, παρερχομένων ἐνιαυτῶν
Ἐξείης παλίνωρα, τὰ γὰρ καὶ πάντα μάλ' αὖτως
Οὐρανῷ ἐὺ ἐνάρηρεν ἀγάλματα νυκτὸς ἰούσης.

ARATUS.

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*HOW TO USE THE MAPS.**

IF the heavens be watched on a clear night, from hour to hour, it w be seen that the star-groups rotate from east to west, around a imaginary axial line. If, instead, the heavens be watched from mont to month, at any fixed hour, it will be found that the stars move i precisely the same manner as in the former case. The amount c change due to one hour's diurnal motion is about equal to the amour due to fifteen days' annual motion. For instance, at 10 P.M. April 7 the heavens present the same appearance as at 9 P.M. April 22, or as a 8 P.M. May 7; at 11 P.M. April 7, the heavens present the same appea ance as at 10 P.M. April 22, or at 9 P.M. May 7; and so on. It is i conformity with these motions that the accompanying maps are cor structed. They represent the appearance of the heavens from mont to month throughout the year; *or* (if the sunlight did not obliterate th stars) we might say that they represent the appearance of the heaven at successive intervals of two hours, all through the twenty-four hours Since the interval between one map and the next is *two* hours, it i evident that at any hour whatever a map can be found giving th appearance of the heavens for an epoch not differing by more than *on* hour from the given hour. One hour's motion alters the face of th heavens so little that a map differing thus by one full hour would serv immediately to indicate the names and positions of the constellations But inasmuch as an observer is not likely to limit his observations t

* The maps in the present work appeared originally in the first twelve monthl parts of *Knowledge*.

any definite interval of a few minutes only, and as, even if he were to, it is easy for him to conceive the effect of a slight retrogression or progression applied to any map whose epoch slightly precedes or follows the hour of observation, it is obvious that the maps are available to give *exact* information at any hour of any day.

This series of maps represents the celestial scenery visible from hour to hour, or from month to month, in the British Isles, and, nearly enough for general purposes, in all places between latitudes 40° and 60° north.

Each map contains the whole of the visible heavens at the hours and date mentioned on it; the centre of the map is the point over the observer's head at the time named, the outline of the map is the observer's horizon; each star is placed in its *proper direction as respects the compass points* (marked in round the map); and each star is placed at its *true proportionate distance from the centre*,—so that, if a star is half-way between the horizon and the point overhead (called the *zenith*), then in the map it is placed half-way between the centre and the circumference; if a star is one-third of the way from the zenith towards the horizon, it is placed in the map one-third of the way from the centre; and so on.

The equator, ecliptic, meridian, and chief vertical circle have been added to assist the beginner in the interpretation of the maps. Such a beginner, on any clear night throughout the year, and at any hour, may find a map which will at once give him the position, as respects altitude and direction, of every star-group above the horizon. The maps, in fact, after a few minutes' study, will be found to explain themselves; but to avoid all possibility of misconception an explanation is appended.

All stars down to the fifth magnitude (inclusive) are marked in, in each map. The Greek letters, or Flamsteed's numbers of all stars down to the fourth magnitude (inclusive) are given, and the names of many of the more conspicuous (or otherwise noted) stars are added. The constellation outlines have been added, as otherwise the Greek lettering would have been useless. The only constellations indicated are those named in my "School Star Atlas" and "Library Star Atlas."

The observer who wishes to know the stars well will not b content with these maps, but by means of atlas star-maps wi explore the depths of the constellations, having once learned the positions and general appearance from these maps, and their histor &c., from such works as my "Easy Star Lessons" (Chatto & Windus) for such purposes my "School Atlas" and my "Library Star Atlas (both published by Longmans) have been constructed.

Of the uses of these maps to beginners it is hardly necessary t speak, but there are many uses to which they may be applied by mo advanced students of astronomy. I have noticed that many who a sufficiently familiar with the constellations, and well acquainted with th principal facts of astronomy, find themselves at a loss if asked suc questions as, "What is the position of Lyra at night in spring?" "Wha *southern* constellations may be seen during a summer night?" "What i the position of the ecliptic at 10 P.M. midwinter?" and so on. Suc questions continually occur to the reader of works on astronomy. Fo instance, he reads that on such and such a date an astronomer observe a star or planet to present such and such an appearance. Now, th *meaning* of such an observation may depend wholly or in part on th position of the star or planet, and therefore it cannot but be convenien to have a work of reference showing the height of the star abov the horizon, or (in the case of a planet) the position of the eclipti at the time of observation. Many other instances might be cited, bu every one who is in the habit of reading astronomical works *thoughtfully* must be familiar with the class of questions referred to. The presen work supplies an immediate answer to all such questions.

The maps are available, *for reference*, in the case of any observatio made within the past century, and, *for use*, during the next, as the have been adapted to the year 1880, and the effects of precessio during sixty or seventy years make scarcely any appreciable alteratio in maps on such a scale as is here employed.

For descriptions of the different constellations (with pictures of th principal ones), and the old-fashioned stories connected with them &c., the reader is referred to my "Easy Star Lessons," which may b regarded as in a sense supplementary to these maps.

SIMPLE REFERENCE TABLE FOR USING THE MAPS.

	From 6 to 8.	8 to 10.	10 to Midn.	Midn. to 2.	2 to 4.	4 to 6.
JANUARY.....	Map XII.	Map I.	Map II.	Map III.	Map IV.	Map V.
FEBRUARY ...	,, I.	,, II.	,, III.	,, IV.	,, V.	,, VI.
MARCH	,, II.	,, III.	,, IV.	,, V.	,, VI.	,, VII.
APRIL.....	,, III.	,, IV.	,, V.	,, VI.	,, VII.	,, VIII.
MAY	,, IV.	,, V.	,, VI.	,, VII.	,, VIII.	,, IX.
JUNE	,, V.	,, VI.	,, VII.	,, VIII.	,, IX.	,, X.
JULY	,, VI.	,, VII.	,, VIII.	,, IX.	,, X.	,, XI.
AUGUST	,, VII.	,, VIII.	,, IX.	,, X.	,, XI.	,, XII.
SEPTEMBER...	,, VIII.	,, IX.	,, X.	,, XI.	,, XII.	,, I.
OCTOBER.....	,, IX.	,, X.	,, XI.	,, XII.	,, I.	,, II.
NOVEMBER ...	,, X.	,, XI.	,, XII.	,, I.	,, II.	,, III.
DECEMBER ...	,, XI.	,, XII.	,, I.	,, II.	,, III.	,, IV.

It is to be noticed that the maps, properly speaking, have no top or bottom. If we want to learn what constellations are visible towards the east, for instance, we turn the proper map (selected as just shown) *so that the letter* E *is downwards, then all the constellations between* E *and the centre of the map will be found on the sky between the eastern horizon and the zenith;* and so with the other points of the compass.

THE following table exhibits the names of all the stars of the f three magnitudes to which astronomers have given names, at least, those whose names are in common use :—

α Andromedæ, *Alpheratz*
β ———, *Mirach Mizar*
γ ———, *Almach*
α Aquarii, *Sadalmelik*
β ———, *Sadalsund*
δ ———, *Skat*
α Aquilæ, *Altair*
β ———, *Alshain*
γ ———, *Tarazed*
α Arietis, *Hamal*
β ———, *Sheratan*
γ ———, *Mesartim*
α Aurigæ, *Capella*
β ———, *Menkalinan*
α Boötes, *Arcturus*
β ———, *Nekkar*
ε ———, *Izar, Mizar, Mirach*
η ———, *Muphrid*
α Canum Ven., *Cor Caroli*
α Canis Majoris, *Sirius*
β ———, *Mirzam*
ε ———, *Adara*
α Canis Minoris, *Procyon*
β ———, *Gomeisa*
α^2 Capricorni, *Secunda Giedi*
δ ———, *Deneb Algiedi*
α Cassiopeiæ, *Schedar*
β ———, *Chaph*
α Cephei, *Alderamin*
β ———, *Alphirk*
γ ———, *Errai*
α Ceti, *Menkar*
β ———, *Diphda*
ζ ———, *Baten Kaitos*
ο ———, *Mira*
α Columbæ, *Phact*
α Coronæ Bor., *Alphecca*
α Corvi, *Alchiba*
δ ———, *Algores*
α Crateris, *Alkes*
α Cygni, *Arided, Deneb Adige*
β ———, *Albireo*
α Draconis, *Thuban*
β ———, *Alwaid*
γ ———, *Etanin*
β Eridani, *Cursa*
γ ———, *Zaurac*
α Geminorum, *Castor*
β ———, *Pollux*
γ ———, *Alhena*
δ Geminorum, *Wesat*
ε ———, *Mebsuta*
α Herculis, *Ras Algethi*
β ———, *Korneforos*
α Hydræ, *Al Fard, Cor Hydræ*
α Leonis, *Regulus, Cor Leonis*
β ———, *Deneb Aleet, Denebola, L*
γ ———, *Algeiba*
δ ———, *Zosma*
α Leporis, *Arneb*
α Libræ, *Zuben el Genubi*
β ———, *Zuben el Chamali*
γ ———, *Zuben Hakrabi*
α Lyræ, *Vega*
β ———, *Sheliak*
γ ———, *Sulaphat*
α Ophiuchi, *Ras Alhague*
β ———, *Cebalrai*
α Orionis, *Betelgeux*
β ———, *Rigel*
γ ———, *Bellatrix*
δ ———, *Mintaka*
ε ———, *Alnilam*
α Pegasi, *Markab*
β ———, *Scheat*
γ ———, *Algenib*
ε ———, *Enif*
ζ ———, *Homan*
α Persei, *Mirfak*
β ———, *Algol*
α Piscis Aust., *Fomalhaut*
ε Sagittarii, *Kaus Australis*
α Scorpionis, *Antares, Cor Scorpio*
α Serpentis, *Unukalhai*
α Tauri, *Aldebaran*
β ———, *Nath*
η ———, *Alcyone* (Pleiad)
α Ursæ Majoris, *Dubhe*
β ———, *Merak*
γ ———, *Phecda*
ε ———, *Alioth*
ζ ———, *Mizar*
η ———, *Alkaid, Benetnasch*
ι ———, *Talitha*
α Ursæ Minoris, *Polaris*
β ———, *Kochab*
α Virginis, *Spica Aximech, Spica*
β ———, *Zavijava*
ε ———, *Vindemiatrix*

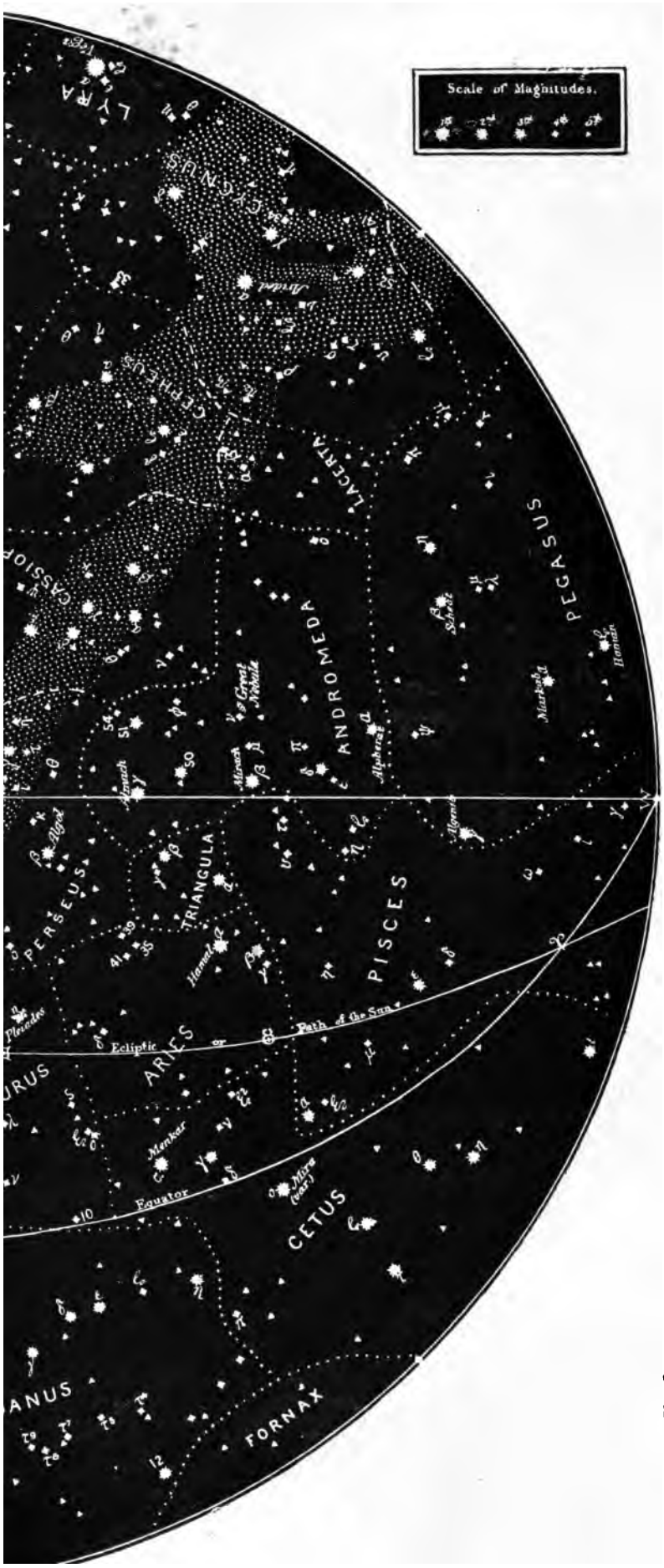
MAP I.

JANUARY.

AP 1.

he Stars on—

midnight.
11·45 p.m.
11·30 p.m.
11·15 p.m.
1· 0 p.m.
0·45 p.m.
0·30 p.m.

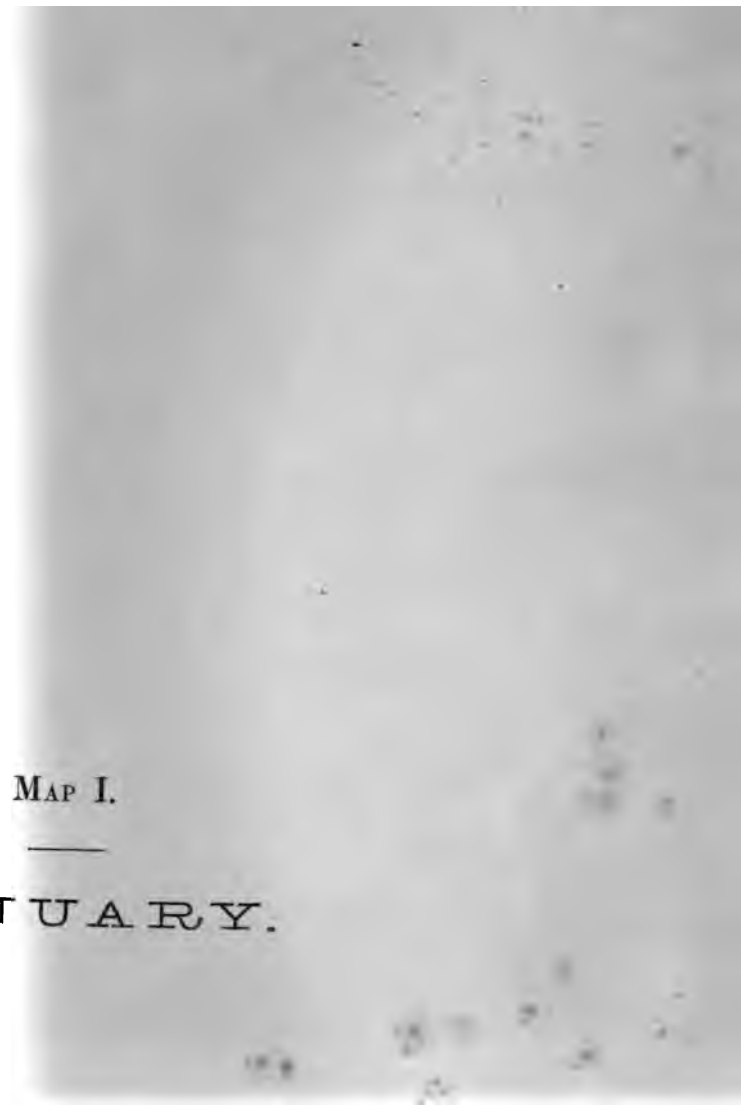


MAP I.

Showing the Sta

Jan. 7 at 10·
Jan. 10 at 9·4
Jan. 14 at 9·3
Jan. 18 at 9·1
Jan. 22 at 9·
Jan. 25 at 8·4
Jan. 29 at 8·3
Feb. 2 at 8·1

Two hours earli
days named in Map
Stars are as in this



MAP I.

JANUARY.

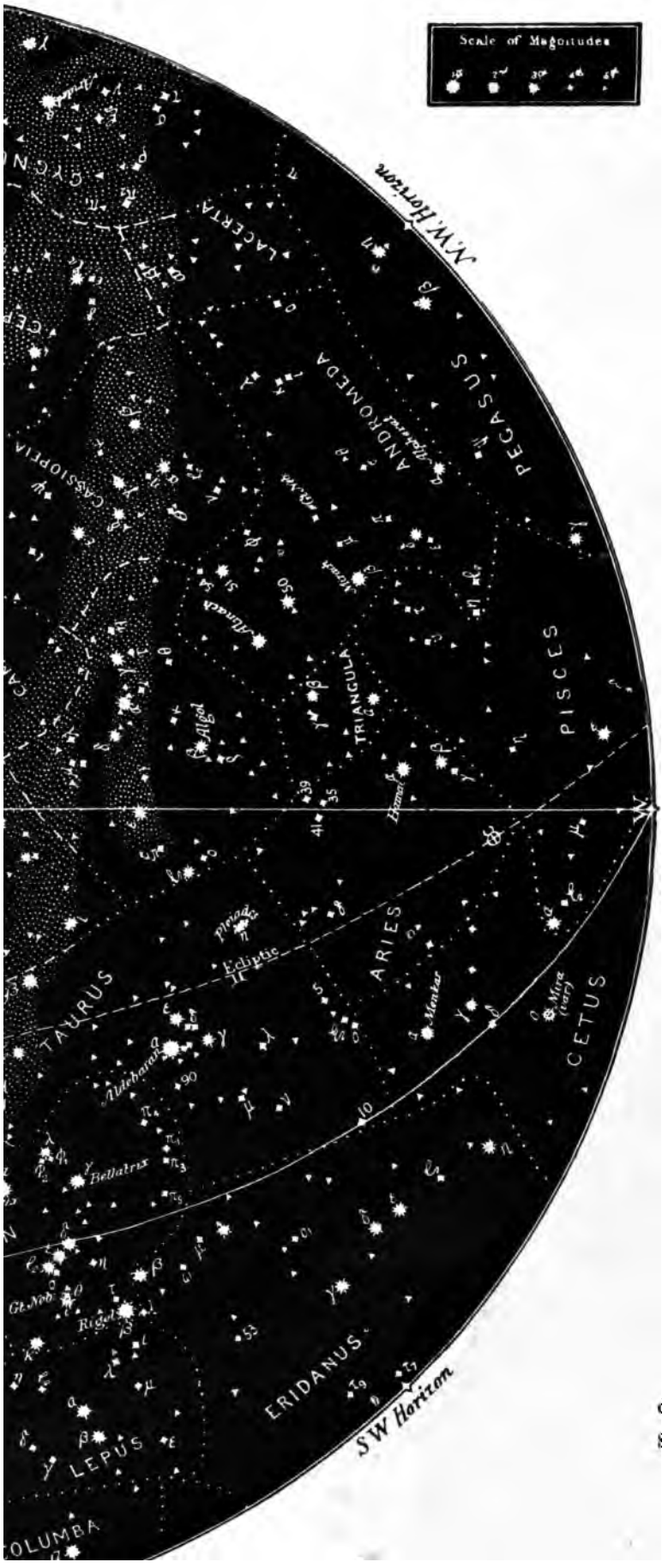
MAP II.

FEBRUARY.

II.

tars on—

dnight.
45 p.m.
30 p.m.
5 p.m.
0 p.m.
5 p.m.
p.m.
p.m.



M

Showing t

Feb. 6
Feb. 10
Feb. 14
Feb. 17
Feb. 21
Feb. 25
Mar. 1
Mar. 5

Two hour
days named
Stars are as

MAP II.

FEBRUARY.

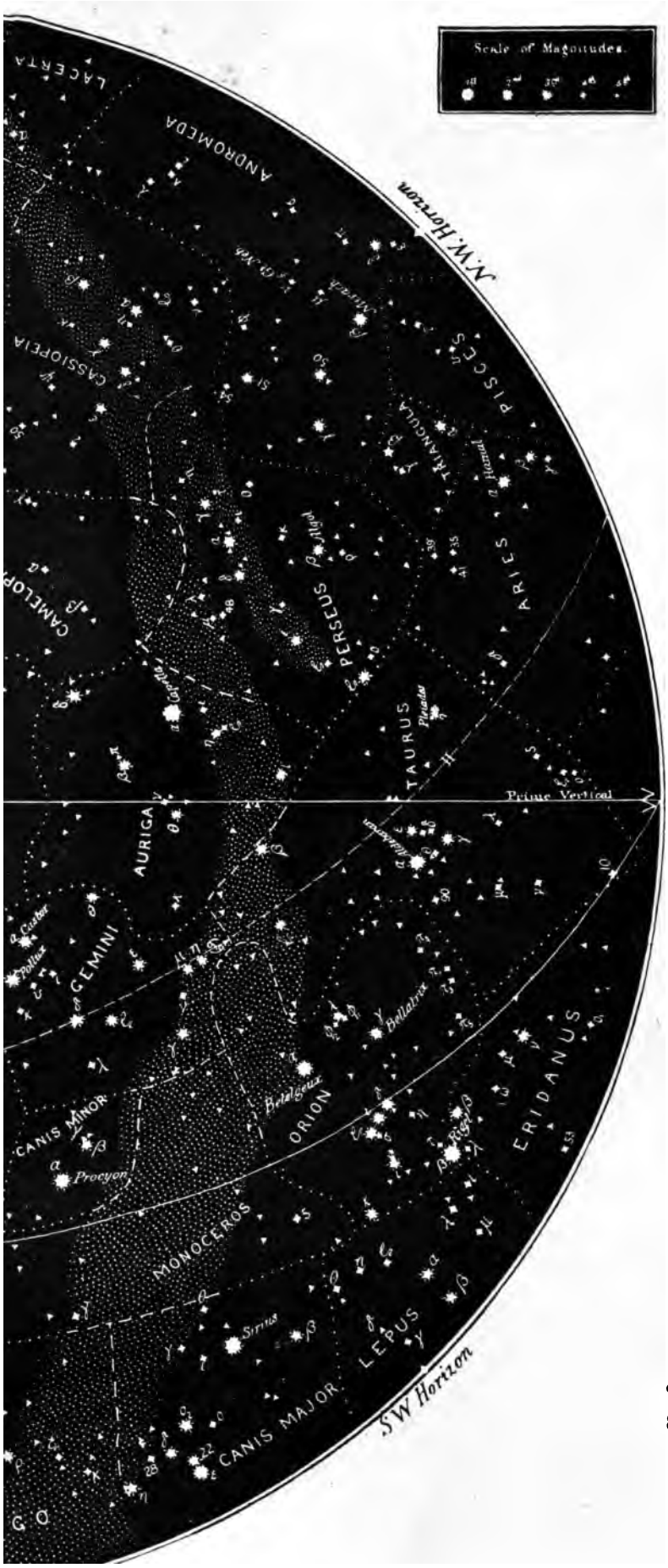
Map III.

MARCH.

AP III.

the Stars on—

at midnight.
t 11·45 p.m.
t 11·30 p.m.
11·15 p.m.
11· 0 p.m.
10·45 p.m.
10·30 p.m.

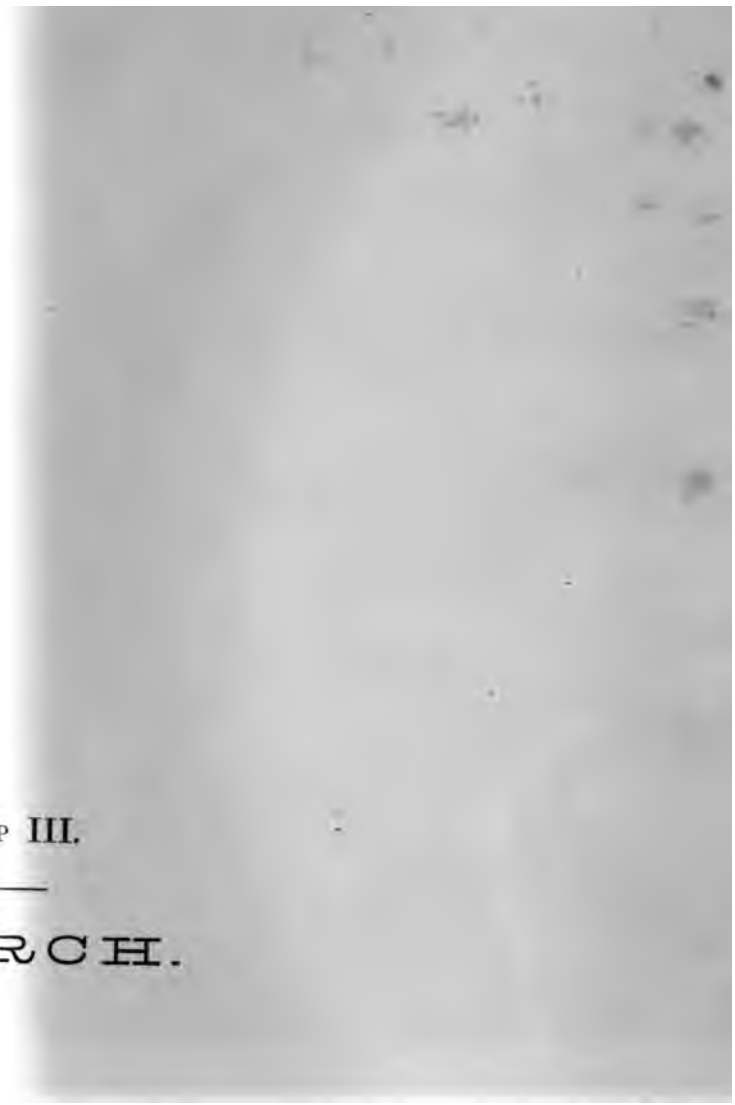


MA

Showing t

Mar. 8
Mar. 12
Mar. 16
Mar. 20
Mar. 23
Mar. 26
Mar. 30
April 2

Two hour
days named
Stars are as i



Map III.

MARCH.

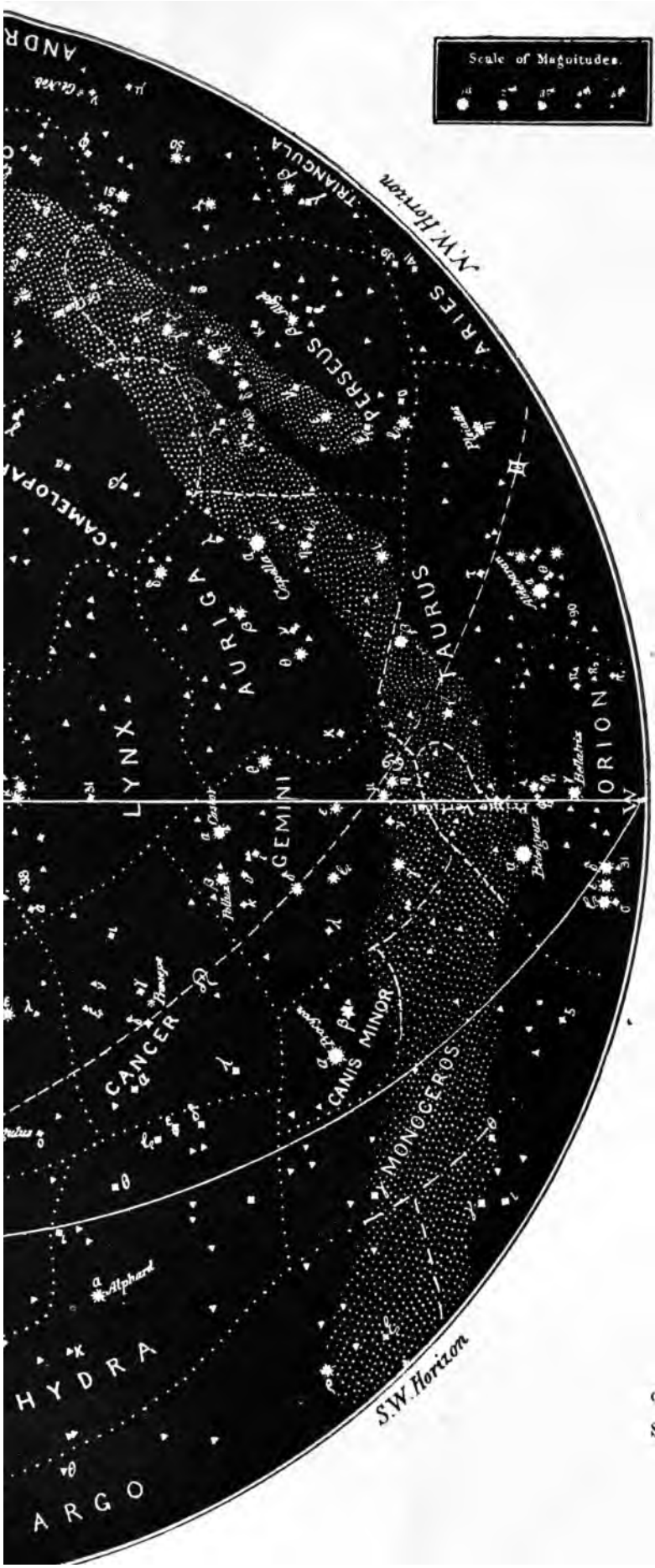
MAP IV.

APRIL.

AP IV.

ie Stars on—

midnight.
11·45 p.m.
11·30 p.m.
11·15 p.m.
11· 0 p.m.
10·45 p.m.
0·30 p.m.
0·15 p.m.



MA

Showing t

April 7
April 10
April 14
April 18
April 22
April 26
April 30
May 3

Two hours
days named
Stars are as i

MAP IV.

APRIL.

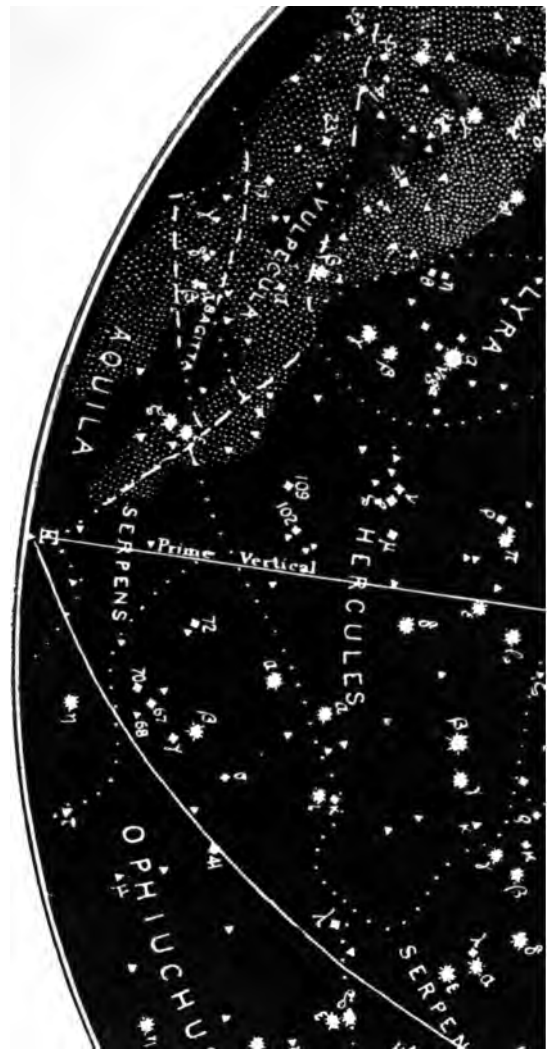
MAP V.

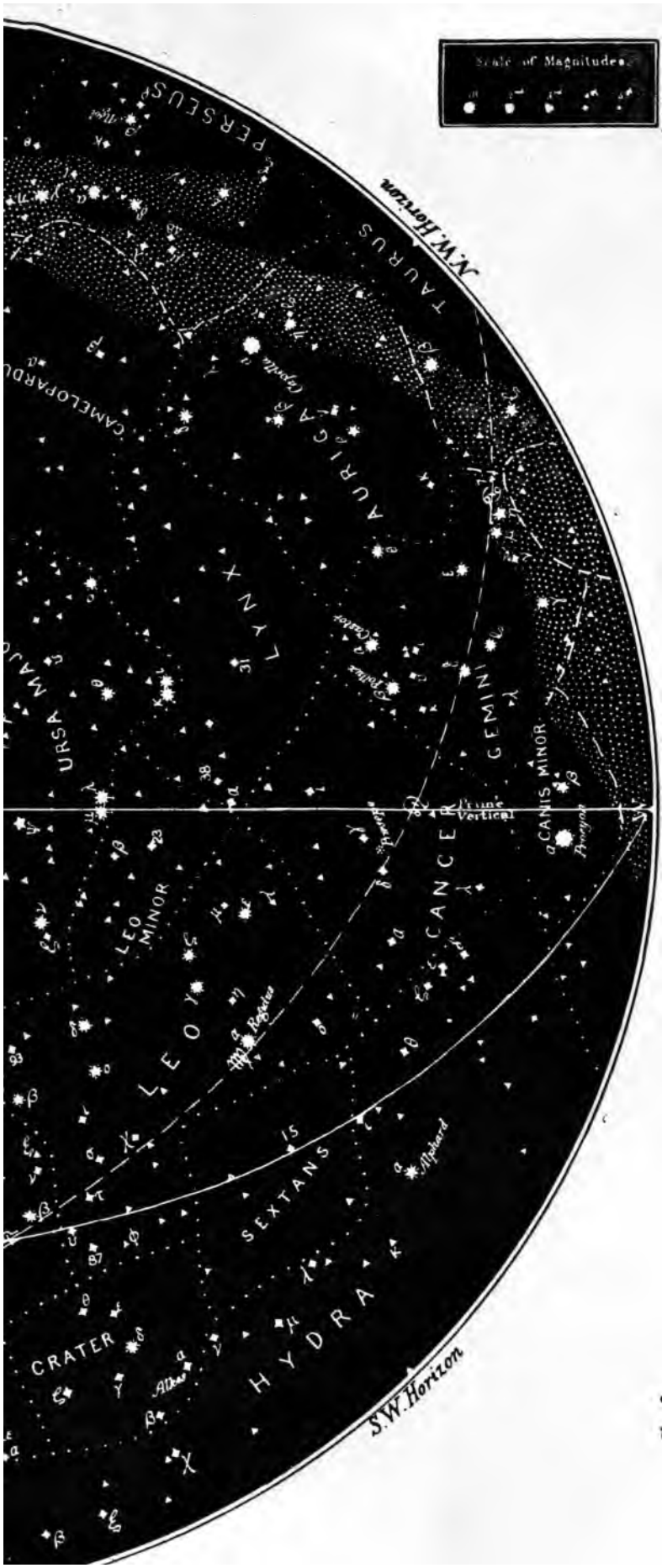
MAY.

MAP V.

the Stars on—

at midnight.
at 11·45 p.m.
at 11 30 p.m.
at 11 15 p.m.
t 11· 0 p.m.
; 10·45 p.m.
10·30 p m.





MAP

Showing the

May 7 at 1
May 11 at
May 15 at
May 19 at
May 22 at
May 26 at
May 30 at
June 3 at

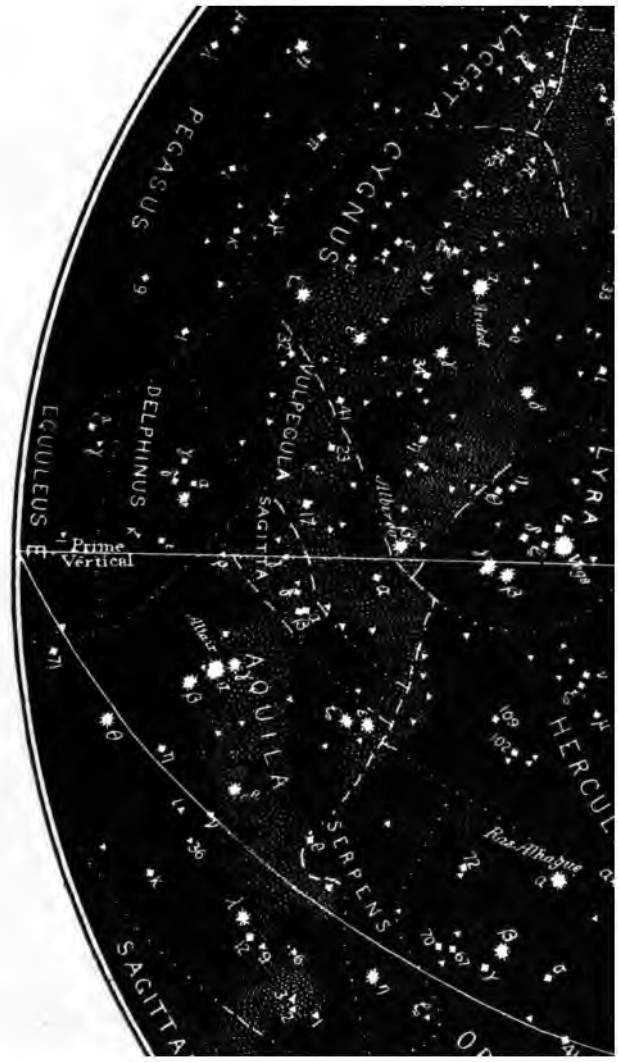
Two hours e
days named in
Stars are as in t

MAP V.

MAY.

Map VI.

JUNE.



off—

ght.

p.m.

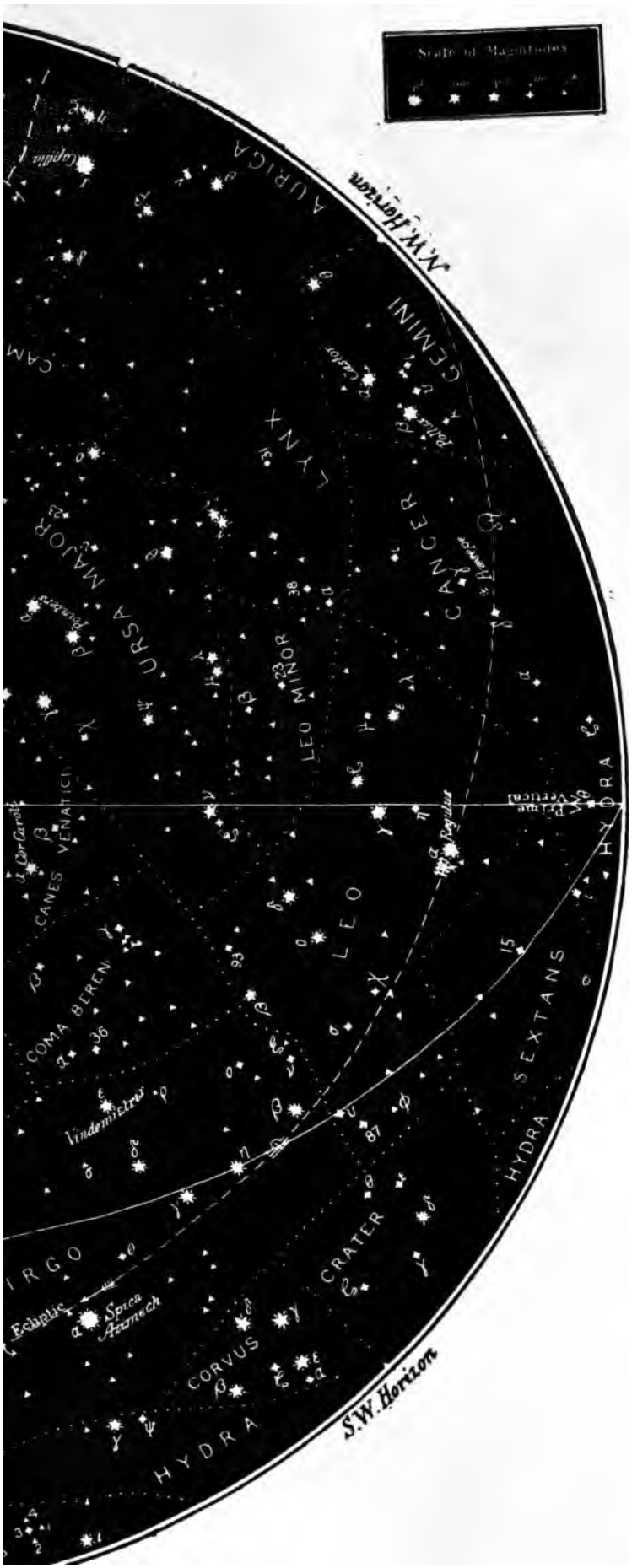
p.m.

p.m.

p m.

p.m.

n m



MAP V

Showing the st

June 7 at 10
June 11 at 9
June 14 at 9
June 18 at 9
June 22 at 9
June 26 at 8
June 30 at 8
July 3 at 8

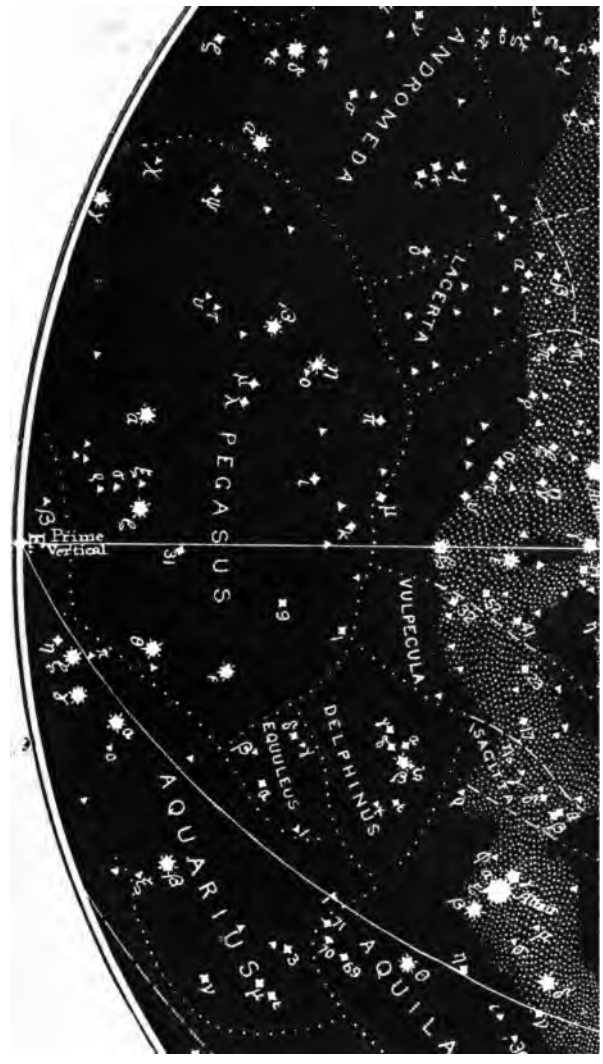
Two hours ear
days named in M
Stars are as in th

MAP VI.

JUNE.

MAP VII.

JULY.



VII.

Stars on—

nidnight.

1·45 p.m.

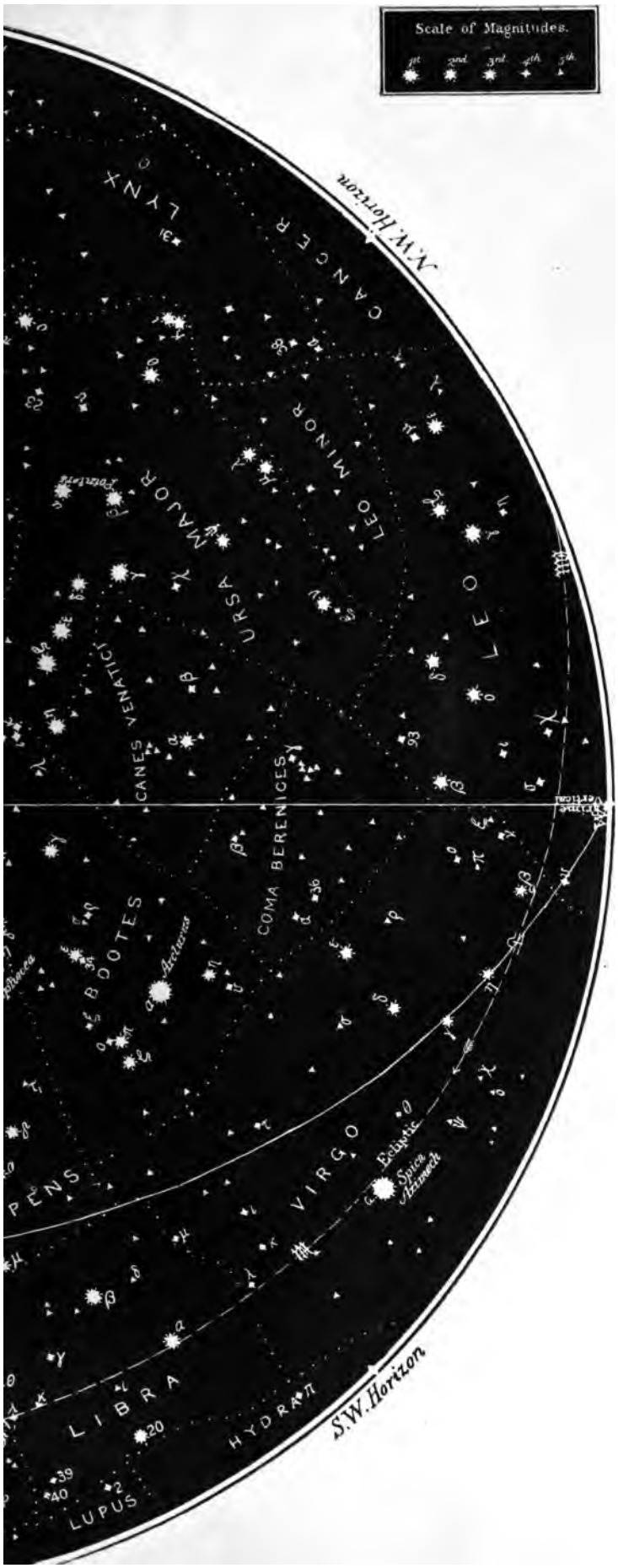
1·30 p.m.

1.15 p.m.

1· 0 p.m.

0·45 p.m.

0·30 p.m.



MAP VII.

Showing the stars on–

July 7 at 10· 0 p.m.
July 11 at 9·45 p.m.
July 14 at 9·30 p.m.
July 18 at 9·15 p.m.
July 22 at 9· 0 p.m.
July 26 at 8·45 p.m.
July 30 at 8·30 p.m.
Aug. 3 at 8·15 p.m.

Two hours earlier, on days named in Map VI., Stars are as in this Map.

MAP VII.

JULY.

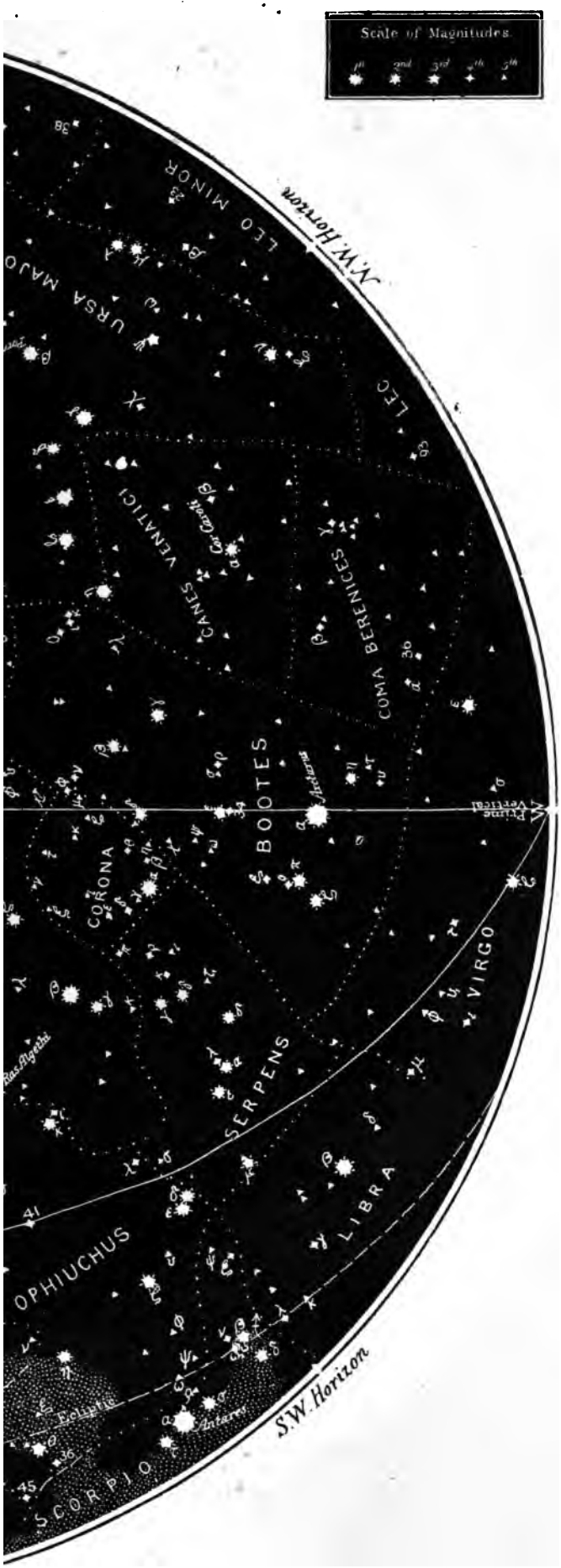
Map VIII.

AUGUST.

AP VIII.

he Stars on—

t midnight.
11·45 p.m.
11·30 p.m.
11·15 p.m.
11· 0 p.m.
10·45 p.m.
10·30 p.m.



MAP VII

Showing the Sta

Aug. 7 at 10·
Aug. 10 at 9·
Aug. 14 at 9·
Aug. 18 at 9·
Aug. 22 at 9·
Aug. 25 at 8·
Aug. 29 at 8·
Sept. 2 at 8·

Two hours earli
days named in Ma
Stars are as in this

MAP VIII.

AUGUST.

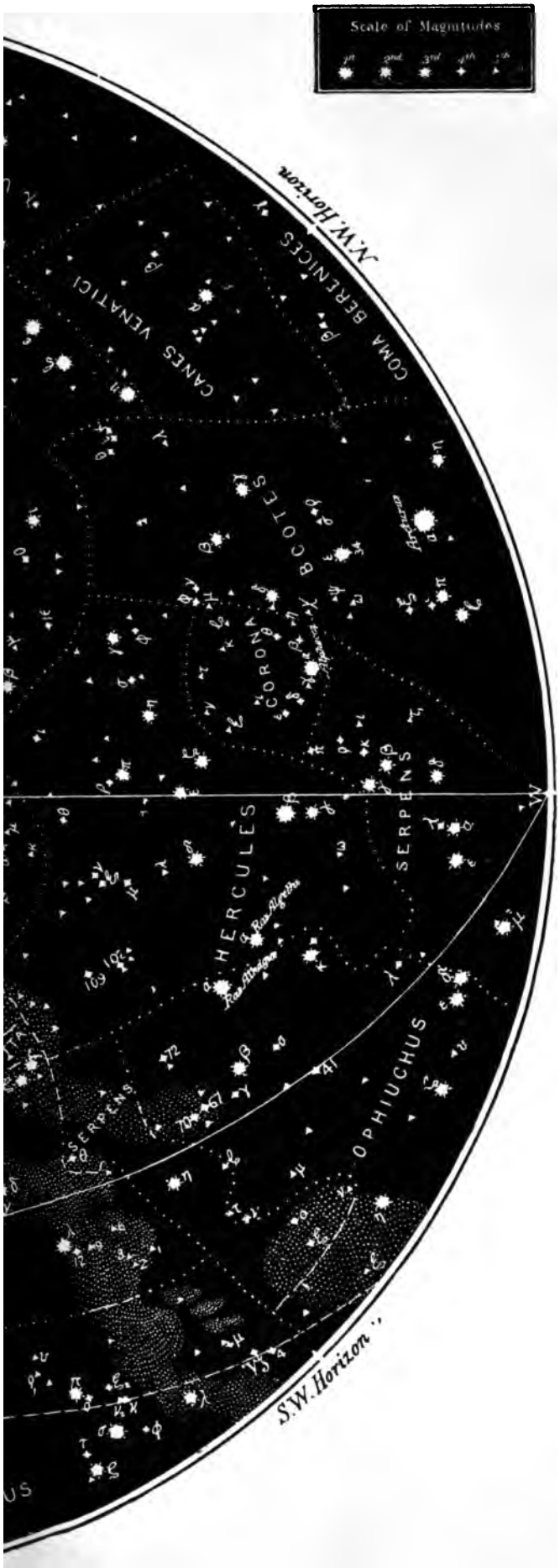
MAP IX.

SEPTEMBER.

MAP IX.

ng the Stars on—

7 at midnight.
10 at 11·45 p.m.
4 at 11·30 p m.
8 at 11·15 p.m.
2 at 11· 0 p.m.
at 10·45 p.m.



MAP I

Showing the S

Sept. 6 at 10
Sept. 10 at 9
Sept. 14 at 9
Sept. 17 at 9
Sept. 21 at 9
Sept. 25 at 8
Sept. 29 at 8
Oct. 3 at 8

Two hours ear
days named in Ma
Stars are as in th

MAP IX.

SEPTEMBER.

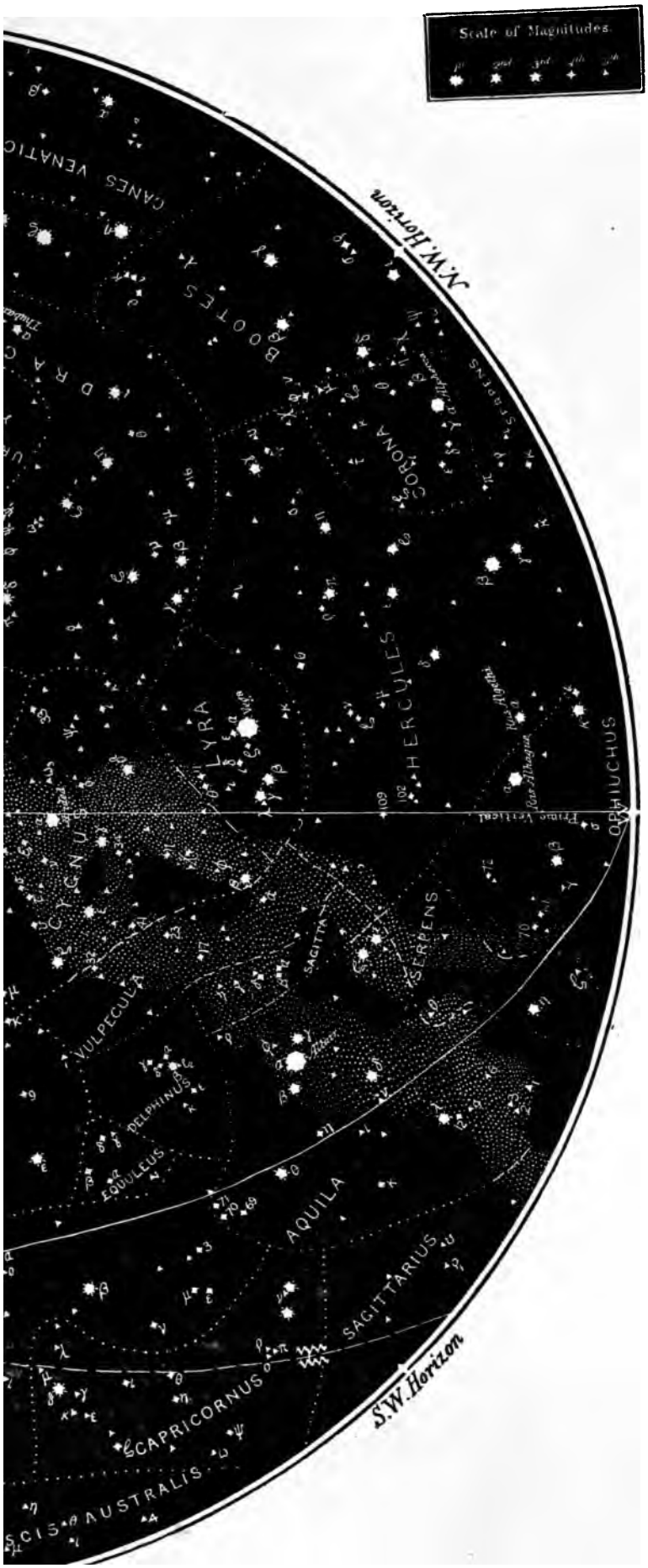
MAP X.

OCTOBER.

' X.

Stars on—

midnight.
1·45 p.m.
1·30 p.m.
1·15 p.m.
1· 0 p.m.
)·45 p m.
)·30 p.m.



MAP X.

Showing the Stars on—

Oct. 7 at 10· 0 p.m.
Oct. 11 at 9·45 p.m.
Oct. 15 at 9·30 p.m.
Oct. 19 at 9·15 p.m.
Oct. 22 at 9· 0 p.m.
Oct 26 at 8·45 p.m.
Oct. 30 at 8·30 p.m.
Nov. 3 at 8·15 p.m.

Two hours earlier, on days named in Map IX., Stars are as in this Map.

MAP X.

OCTOBER.

MAP XI.

NOVEMBER.

XI.

Stars on—

idnight.

1·45 p.m.

1·30 p.m.

1·15 p.m.

MAP X

Showing the St

Nov.	7 at	10
Nov.	10 at	9
Nov.	14 at	9
Nov.	18 at	9
Nov.	22 at	9
Nov.	26 at	8
Nov.	30 at	8
Dec.	4 at	8

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MAP XI.

NOVEMBER.

Map XII.

DECEMBER.

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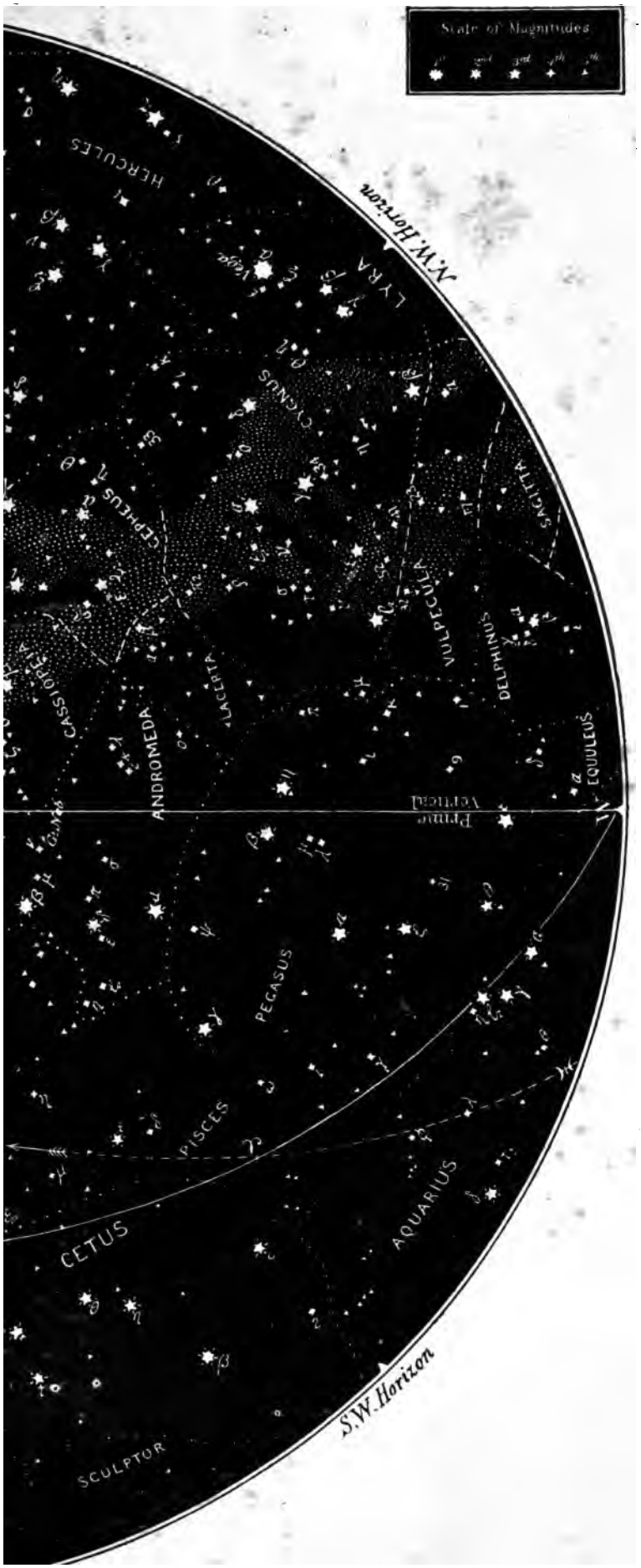

MAP XI

Showing the St

Dec. 7 at 10·
Dec. 11 at 9·
Dec. 15 at 9·
Dec. 19 at 9·
Dec. 23 at 9·
Dec. 26 at 8·
Dec. 30 at 8·
Jan. 3 at 8·

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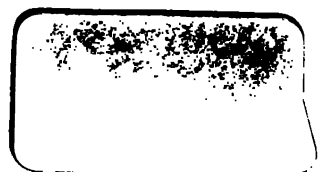
MAP XII.

DECEMBER.



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